



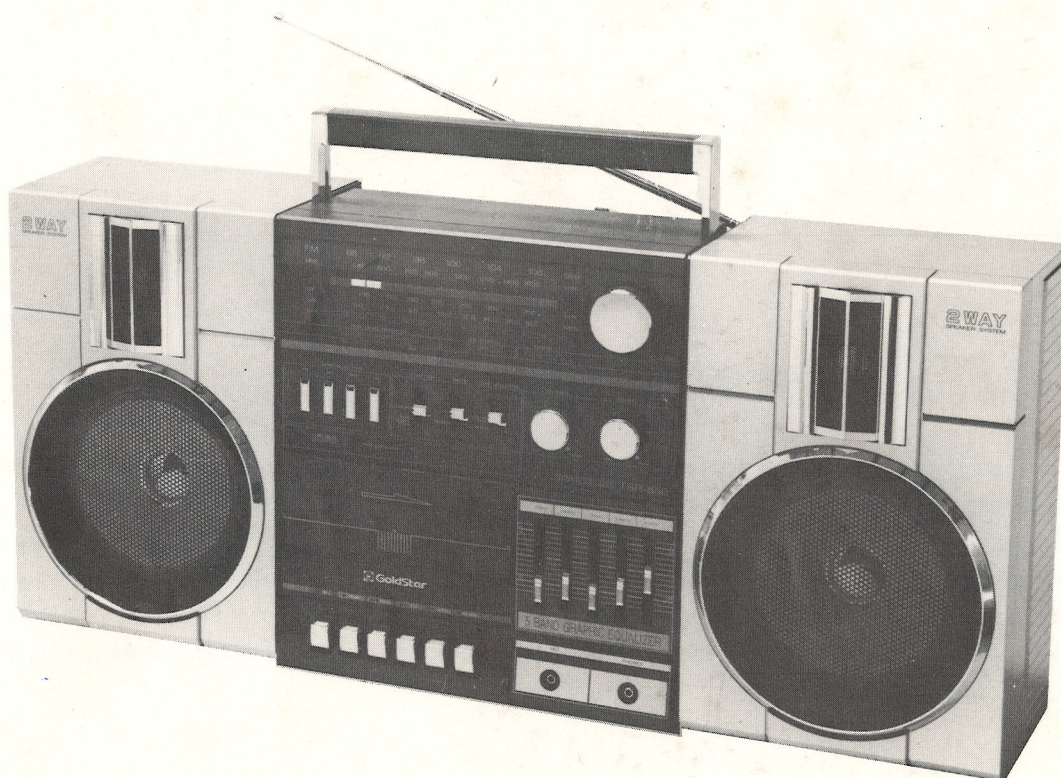
GoldStar

Service Manual

TSR-850

FM/MW/LW/SW
STEREO CASSETTE RECORDER

MODEL TSR-850



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PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this manual, electrical components having such features are identified by a  in the schematic diagram and the parts list. Before replacing any of these components, read the parts list in this manual carefully. The use of substitute replacement parts which do not have the same safety characteristics as specified in the parts list may create shock, fire or other hazards.

SPECIFICATIONS

General Performance Specifications

Item		Specification
1.	Circuit system	1. Radio-FM, MW, LW, SW 2. Tape- 4 track, 2 channel Rec/PB
2.	Semiconductors	IC (9EA) KIA7358P (FM FRONT), KIA7640AP (FM/AM IF), KIA7343P(FM MPX) KA1222 (EQ), LA3160 (EQ), KA2224 (PRE-AMP), LA3220 (PRE-AMP) LB1423 (LED DRIVE), M5226P (G-EQ), HA1392 (POWER AMP)
		TR (8EA) KTC380TM-O, KTC9013A-H, KTC9014A-C, GS-2013H
		Diode (12EA) 1S2236 (AFC), 1S2472, ZPD9.1V, ZPD10V, MI-151, MI-151R
		LED (3EA) Tuning (GN) 1 Dot, Stereo (RD) 1 Dot, Level (RD) 5 Dot.
3.	Feature	1. Radio: FM, MW, LW, SW 2. Tape: Normal, CrO ₂ (Metal-PB) 3. Graphic EQ: 100Hz, 340Hz, 1kHz, 3.4 kHz, 10kHz 4. LED: Stereo, Tuning, Level (5 Dot) 5. Single rod antenna. 6. 2 way 4 speaker system (Internal) 7. Stereo, Mono 8. Balance, Main Volume 9. C-Mic W/External Mic 10. Deck: Front loading & Auto stop system 11. Din Jack in (In/Out)-Optional
4.	Speaker	Woofer: 5 $\frac{1}{4}$ Inch (4 ohm $\times$ 2) Tweeter: Piezo $\times$ 2
5.	Power source	DC: 12V ("D" cell $\times$ 8) AC: 100 $\sim$ 240, 50/60Hz (Optional)

MW Performance Specifications

Item		Test Freq. (kHz)	Unit	Limit	Nominal	Test Condition
1.	Frequency range		kHz	525 $\sim$ 1630	515 $\sim$ 1650	
2.	Intermediate frequency		kHz		455 or 465	Option
3.	Sensitivity	600	dB	58	50	Mod. 30% 400Hz
		1000	dB	56	50	R.O.P: 50 mW
		1400	dB	56	50	S/N: 20 dB
4.	S/N ratio	1000	dB	35	40	Input: 74 dB, Mod: 30% 400Hz R.O.P.: 50mW = 0 dB
5.	I.F. rejection ratio	600	dB	30	40	
6.	Image rejection ratio	1400	dB	26	36	
7.	Selectivity	1000	dB	15	25	$\pm$ 9 kHz
8.	10% T.H.D. power output	1000	mW	3.5W/2.8W		DC/AC
9.	T.H.D.	1000	%	5	2	Mod: 30%, 400Hz Input: 74dB
10.	Audio response	100Hz	1000	dB	0 $\pm$ 6	Mod: 30%, 400Hz
		4 kHz	1000	dB	-13 $\pm$ 6	Input: 74 dB

LW Performance Specifications

	Item	Test Freq. (kHz)	Unit	Limit	Nominal	Test Condition
1.	Frequency range		kHz	140 ± 10 $\sim 360 \pm 20$	140~360	
2.	Intermediate frequency		kHz		455 or 465	Option
3.	Sensitivity	160	dB/m	65	58	Mod: 30%, 400Hz
		260	dB/m	65	58	R.O.P.: 50mW
		330	dB/m	65	58	(S/N 20 dB)
4.	Image rejection ratio	330	dB	26		
5.	I.F. rejection ratio	260	dB	30	35	74 dB, 30%, 400Hz Mod.

SW Performance Specifications

	Item	Test Freq. (MHz)	Unit	Limit	Nominal	Test Condition
1.	Frequency range		MHz	5.7~18.5	5.8~18.3	
2.	Intermediate frequency		kHz		455 or 465	Option
3.	Sensitivity	6.5	dB/m	45	35	330Ω + 10PF series
		11	dB/m	45	35	dummy use.
		16	dB/m	45	35	(S/N 20 dB)
4.	Image rejection ratio	16	dB	2	5	"
5.	S/N ratio	11	dB	35	45	"

FM Performance Specifications

	Item	Test Freq. (MHz)	Unit	Limit	Nominal	Test Condition
1.	Frequency range		MHz	87.35 ~108.25		FTZ spec adjustment: Low-87.35, High-108.25
2.	Intermediate frequency		MHz	10.7 ± 0.1	10.7	
3.	Sensitivity	90	dB	18	10	S/N 26 dB
		98	dB	18	10	Dev.: 22.5 kHz, 400Hz
		106	dB	18	10	50mW output
4.	S/N Ratio	98	dB	50	60	Input 60 dB, Dev: 22.5kHz, 40Hz Power: DC12V
5.	I.F. rejection ratio	90,98	dB	60	70	
6.	Image rejection ratio	90,98,106	dB	25	30	
7.	Automatic Frequency control	98	kHz	$\pm 250 \pm 100$	± 250	Dev.: 22.5 kHz, 400Hz Input: 40 dB, -3 dB
8.	10% THD power output	98	mW	3.5/2.8W		
9.	T.H.D.	98	%	3	1	Dev.: 22.5kHz, 400Hz, 1 kHz Input: 60 dB, R.O.P.: 50mW
10.	Audio response	100Hz	dB	0 ± 3		Pre-Amp Asia, USA: 7μS
		10kHz	dB	0 ± 3		Europe: 50μS Dev: 22.5kHz 1kHz = 0 dB
11.	Stereo separation	98	dB	20 (1kHz)	30 (1kHz)	

Tape Performance Specifications

Item		Test Tape	Unit	Limit	Test Condition
1.	Tape speed	MTT-111	cm/sec	$\pm 3 \%$	
2.	Winding time	F.F.	C-60	sec	110
		Rew	C-60	sec	110
3.	Wow & Flutter	MTT-111	%	0.3	JIS WRMS
4.	Frequency response (Play)	Normal	MTT-216	dB	± 6
		CrO ₂ , Metal	MTT-316	dB	± 6
5.	Frequency response (Rec/Play)	Normal	MTT-502	dB	± 6
		CrO ₂		dB	± 6
6.	Distortion	Play	MTT-118	%	3
		Rec/Play	MTT-501	%	5
7.	S/N ratio	Play	MTT-112S	dB	40
		Rec/Play	MTT-501	dB	36
8.	Cross talk	Track	MTT-121	dB	35
		Channel	MTT-141	dB	35
9.	Erase ratio	MTT-502	dB	40	Input: -40 dBm 1kHz B.P.F. Use.
10.	Azimuth alignment	MTT-114	dB	3	at 8kHz

NOTE: Nominal specs represent the design specs: all units should be able to approximate these—some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition which still might be considered acceptable: in no case should a unit perform to less than within any limit spec.

DIAL CORD STRINGING

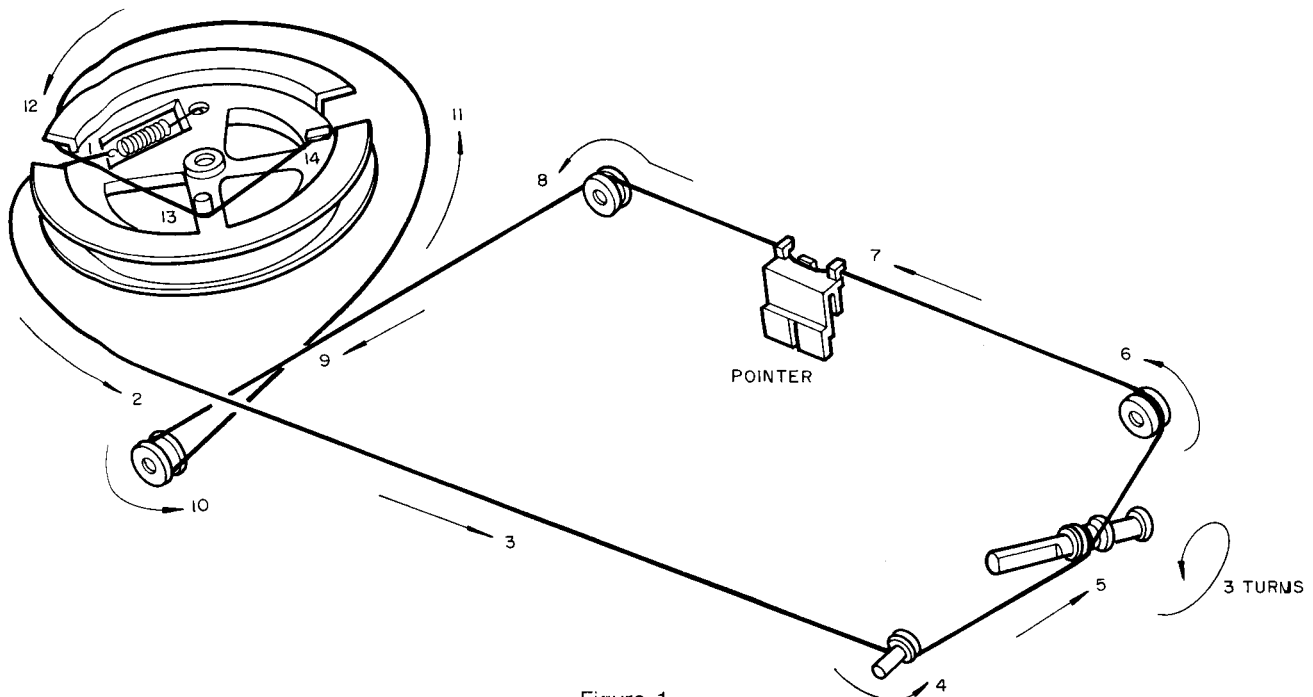
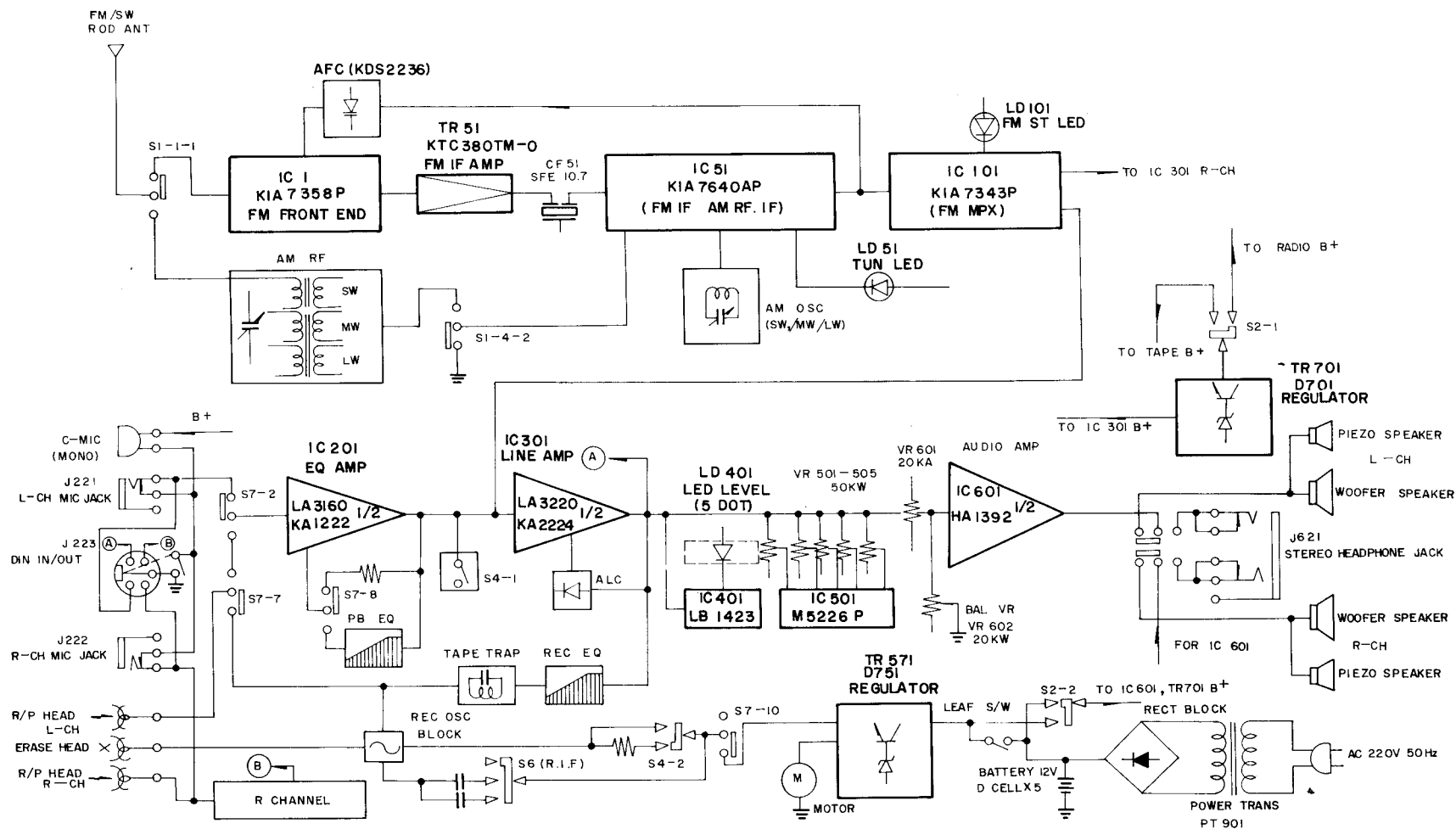


Figure 1.

Set the tuning capacitor to minimum frequency and string the cord following the numbers in figure 1.

BLOCK DIAGRAM



ALIGNMENT INSTRUCTIONS

Equipment Needed

1. AM Signal Generator
2. FM Signal Generator
3. IF Sweep Generator with marker Capabilities
4. FM Stereo Signal Generator
5. Oscilloscope
6. Output Meter (VTVM)
7. FM MPX Signal Generator
8. Frequency Counter
9. Nonmetallic Alignment Tools

Important

1. Check power-source voltage.
2. Set the function switch to band being aligned.
3. Turn volume control to minimum unless otherwise noted.
4. Connect low side of signal source and output indicator to chassis ground unless otherwise specified.
5. Keep the signal input as low as possible to avoid AGC and AFC action.
6. Standard modulation is 400 Hz at 30% for AM. (400 Hz at 22.5 kHz deviation for FM)

Test and adjustment points

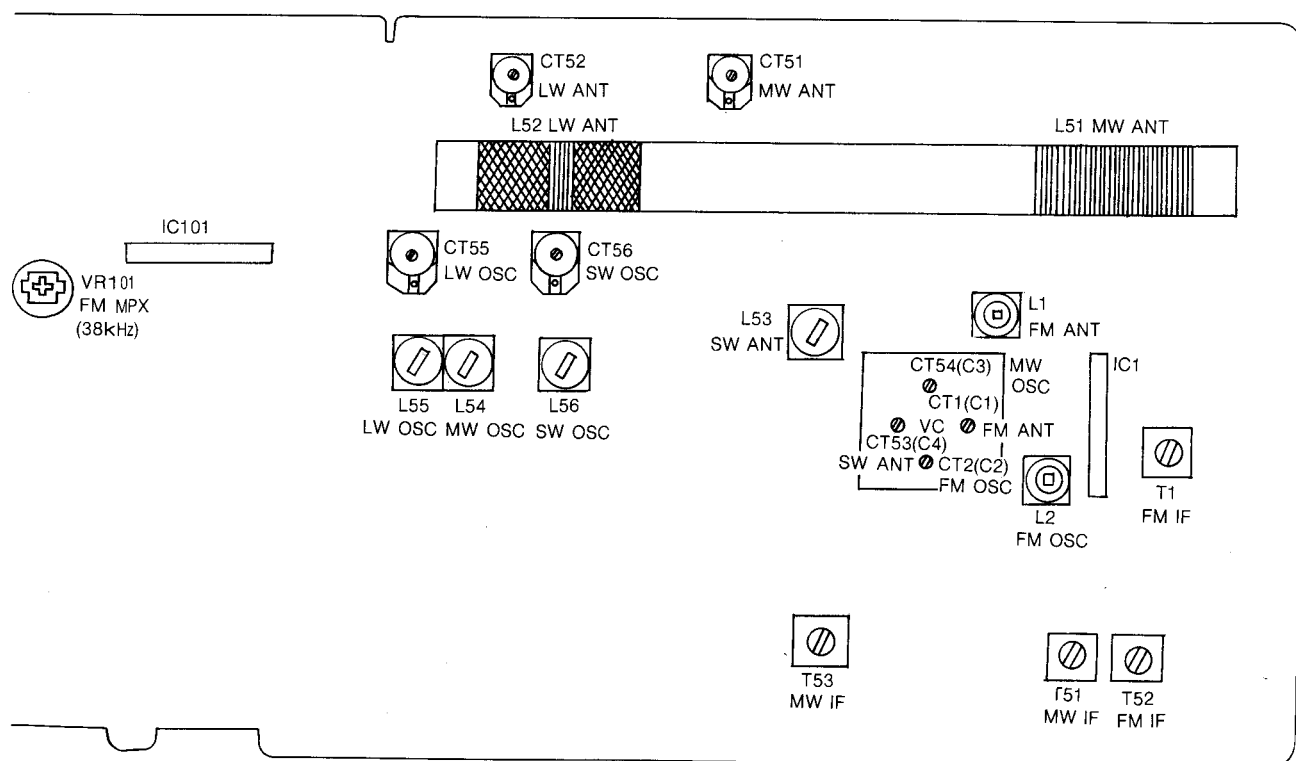


Figure 2. RF P.C. BOARD

MW Section

Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
IF	AM Signal Generator with loop antenna. Output Meter (VTVM) across 4 ohm load. (Figure 3)	1	455 or 465 kHz (400 Hz Mod.)	Tuning gang fully closed	T51, T53 (AM IFT). Adjust for maximum output.
		2			Repeat until no further improvement can be made.
Band	AM Signal Generator with loop antenna. Output Meter (VTVM) across 4 ohm load. (Figure 4)	3	515 kHz (400 Hz Mod.)	Tuning Gang fully closed	L54 (MW OSC. Coil). Adjust for maximum output.
		4	1650 kHz (400 Hz Mod.)	Tuning Gang fully open	CT54 (MW OSC. Trimmer). Adjust for maximum output.
		5			Repeat steps 3 & 4.
Tracking	AM Signal Generator with loop antenna. Out Meter (VTVM) across 4 ohm load. (Figure 4)	6	600 kHz (400 Hz Mod.)	Tune to signal	L51 (MW Ant. Coil). Adjust coil on ferrite core for maximum output.
		7	1400 kHz (400 Hz Mod.)	Tune to signal	CT51 (MW Ant. Trimmer). Adjust for maximum output.
		8			Repeat steps 6 & 7 several times.

LW Section

Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
Band	AM Signal Generator with loop antenna. Output Meter (VTVM) across 4 ohm load. (Figure 4)	1	104 kHz (400 Hz Mod.)	Tuning Gang fully closed	L55 (LW OSC. Coil). Adjust for maximum output.
		2	360 kHz (400 Hz Mod.)	Tuning Gang fully open	CT55 (LW OSC. Trimmer). Adjust for maximum output.
		3			Repeat steps 1 & 2.
Tracking	AM Signal Generator with loop antenna. Output Meter (VTVM) across 4 ohm load. (Figure 4)	4	160 kHz	Tune to signal	L52 (LW Ant. Coil). Adjust coil on ferrite core for maximum output.
		5	330 kHz	Tune to signal	CT52 (LW Ant. Trimmer). Adjust for maximum output.
		6			Repeat steps 4 & 5 several times.

SW Section

Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
Band	AM Signal Generator to antenna terminals through SW dummy matching network. Output Meter (VTVM) across 4 ohm load. (Figure 6)	1	5.7 MHz (400 Hz Mod.)	Tuning Gang fully closed	L56 (SW OSC. Coil). Adjust for maximum output.
		2	18.5 MHz (400 Hz Mod.)	Tuning Gang fully open	CT56 (SW OSC. Trimmer). Adjust for maximum output.
		3			Repeat steps 1 & 2.
Tracking	AM Signal Generator to antenna terminals through SW dummy matching network. Output Meter (VTVM) across 4 ohm load. (Figure 6)	4	6.5 MHz	Turn to signal	L53 (SW Ant. Coil). Adjust for maximum output.
		5	16 MHz	Tune to signal	CT53 (SW Ant. Trimmer). Adjust for maximum output.
		6			Repeat steps 4 & 5 several times.

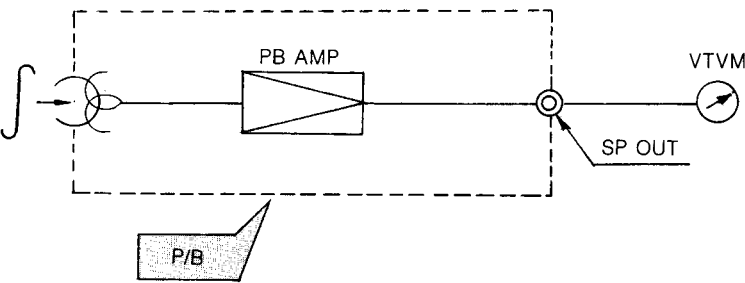
FM Section

Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
IF	IF Sweep Generator Marker Generator to FM Ant. Terminals. Oscilloscope across body of IC1 (Figure 5)	1	10.7 MHz	Tuning Gang fully closed	T1, T52 (FM IFT). Adjust for maximum symmetrical response (10.7 MHz at the center point).
		2			Repeat step 1
Band	FM Signal Generator to antenna terminals through 75 ohm antenna matching Network, Output Meter (VTVM) across 4 ohm load. (Figure 7)	3	87.35 MHz (400 Hz Mod.)	Tuning Gang fully closed	L2 (FM OSC. Coil). Adjust for maximum output.
		4	108.25 MHz (400 Hz Mod.)	Tuning Gang fully open	CT2 (FM OSC. Trimmer). Adjust for maximum output.
		5			Repeat steps 3 & 4 several times.
Tracking	FM Signal Generator to antenna terminals through 75 ohm antenna matching network, Output Meter (VTVM) across 4 ohm load. (Figure 7)	6	90 MHz (400 Hz Mod.)	Tune to signal	L1 (FM Ant Coil). Adjust for maximum output.
		7	106 MHz (400 Hz Mod.)	Tune to signal	CT1 (FM Ant Trimmer). Adjust for maximum output.
		8			Repeat steps 6 & 7 to obtain suitable sensitivity at 90 MHz and 106 MHz.

FM MPX

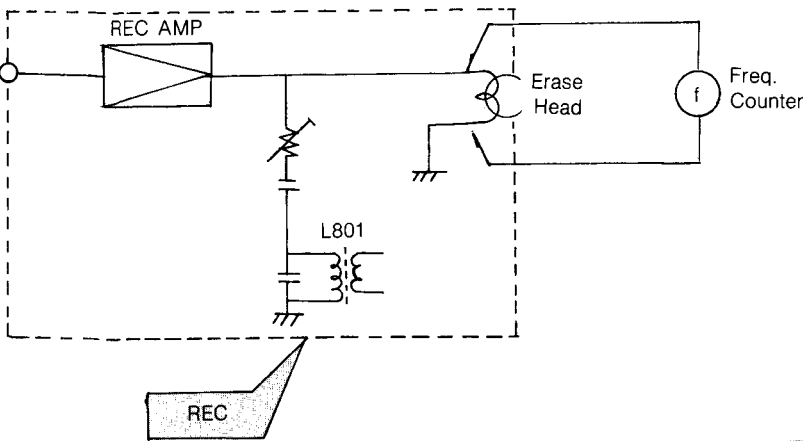
Circuit Alignment	Equipment Connection	Step	Generator Frequency	Dial Setting	Adjustment
38 kHz	FM signal Generator composite out connected to Ext. Mod of FM Signal Generator.	1			First make sure FM section properly aligned.
	FM Signal Generator to antenna terminals matching 75 ohm antenna matching Network. Frequency Counter across TP (pin No. 6 of IC101) (Figure 8)	2	98 MHz (1 mV output)	98 MHz	Adjust VR101 for Frequency Counter indicates 38 kHz.

Azimuth Adjustment



Input	Adjust for	Adjustment
MTT-114 (10 kHz)	Maximum	Azimuth Adjusting screw

Bias Frequency Adjustment



Input	Adjust for	Adjustment
No signal	60 kHz	L801

NOTE. RIF SW: "1" position.

TEST EQUIPMENT CONNECTIONS

Figure 3. MW IF

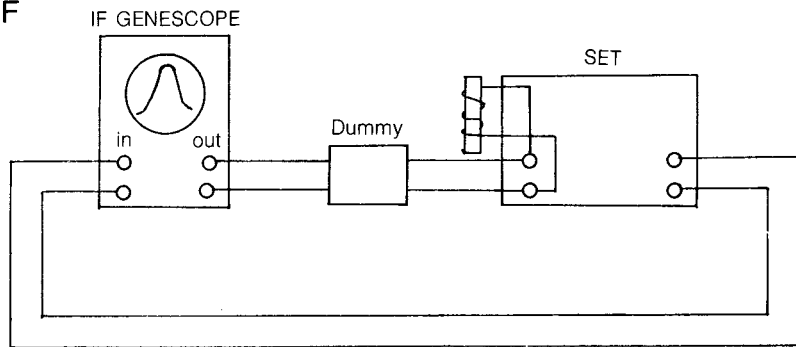


Figure 4. LW and MW Band/Tracking

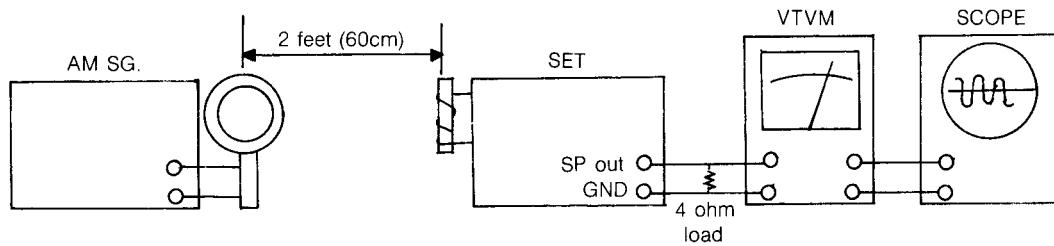


Figure 5. FM IF

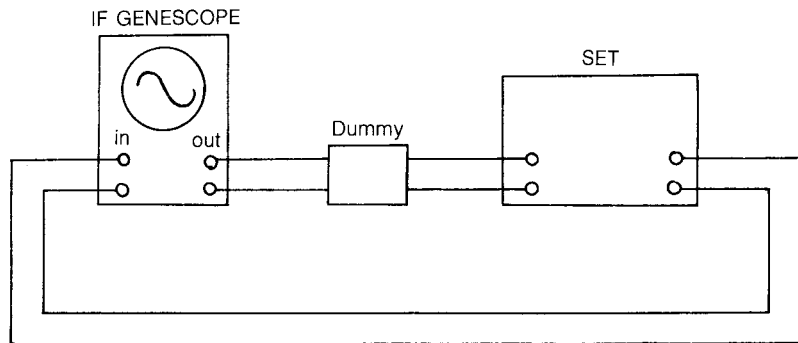


Figure 6. SW Band/Tracking

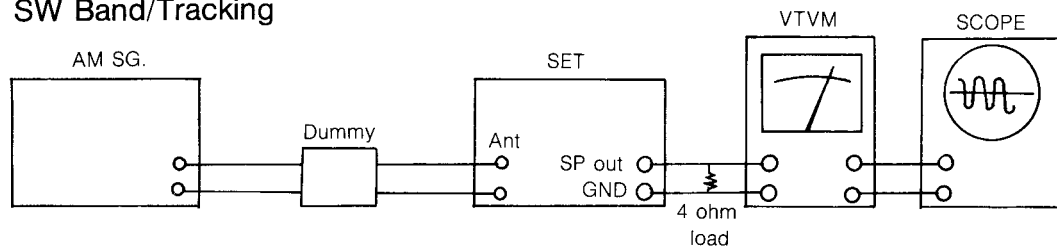


Figure 7. FM Band/Tracking

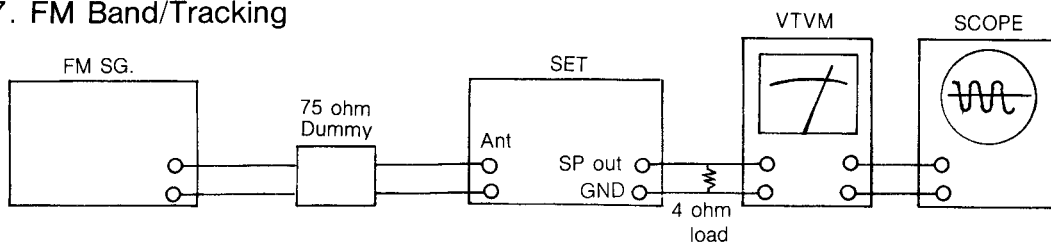
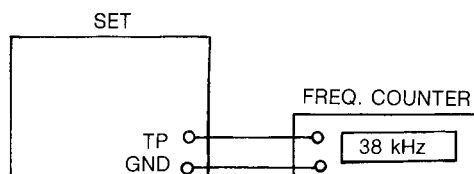


Figure 8. 38 kHz Pilot



STANDARD MAINTENANCE

Tape Head and Capstan Cleaning

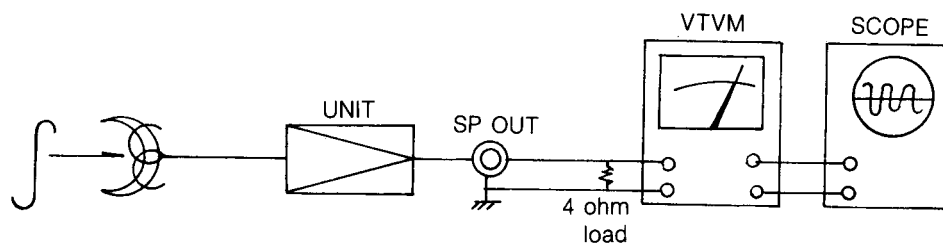
Whenever a unit is brought in for service or repair, clean the tape heads, capstan drive shaft and other tape handling surfaces to ensure proper tape handling and optimum frequency response. Use a cotton swab dipped in head cleaner or denatured alcohol to clean all tape handling surfaces. Wipe dry.

Tape Head Demagnetization

Do not use magnetized tools near the tape heads, since they can magnetize the heads. After long period of use, the heads will retain a small amount of residual magnetism. A magnetized head will result in loss of high frequency response and increased noise. Use a standard tape head demagnetizer and follow the instructions supplied with it to demagnetize the heads.

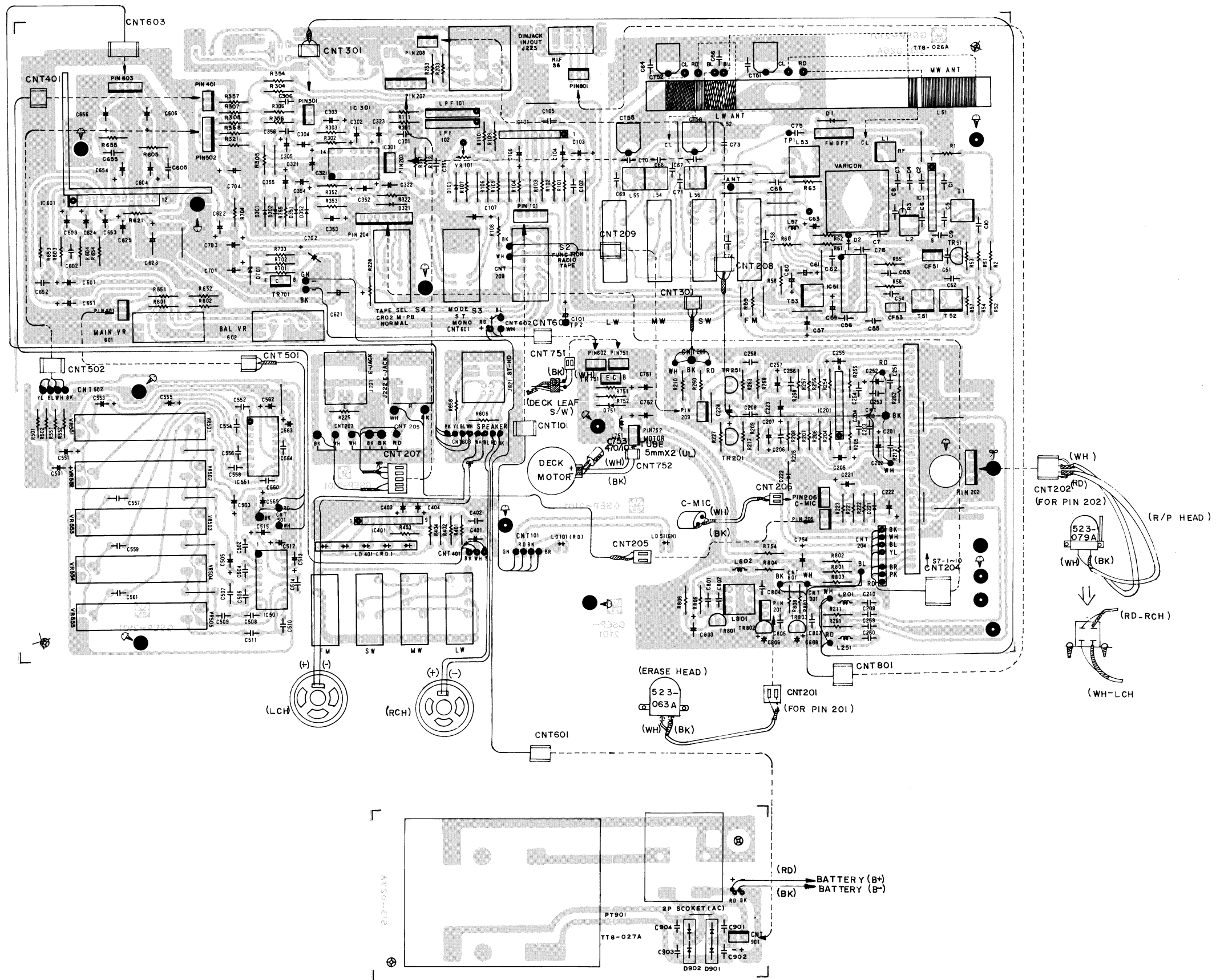
Azimuth Adjustment

1. Azimuth adjustment is normally required when the head is replaced, or for cases of cross-talk and poor high frequency response. A test tape is required for such adjustment.
2. Connect a scope or VTVM to the right channel SP OUT. Insert a test tape into the unit (use a test tape such as TEAC MTT-114, MTT-155). Adjust the azimuth adjustment screw for maximum output onto the right channel. Use glyphal or other non-hardening cement to lock the azimuth adjustment screw.

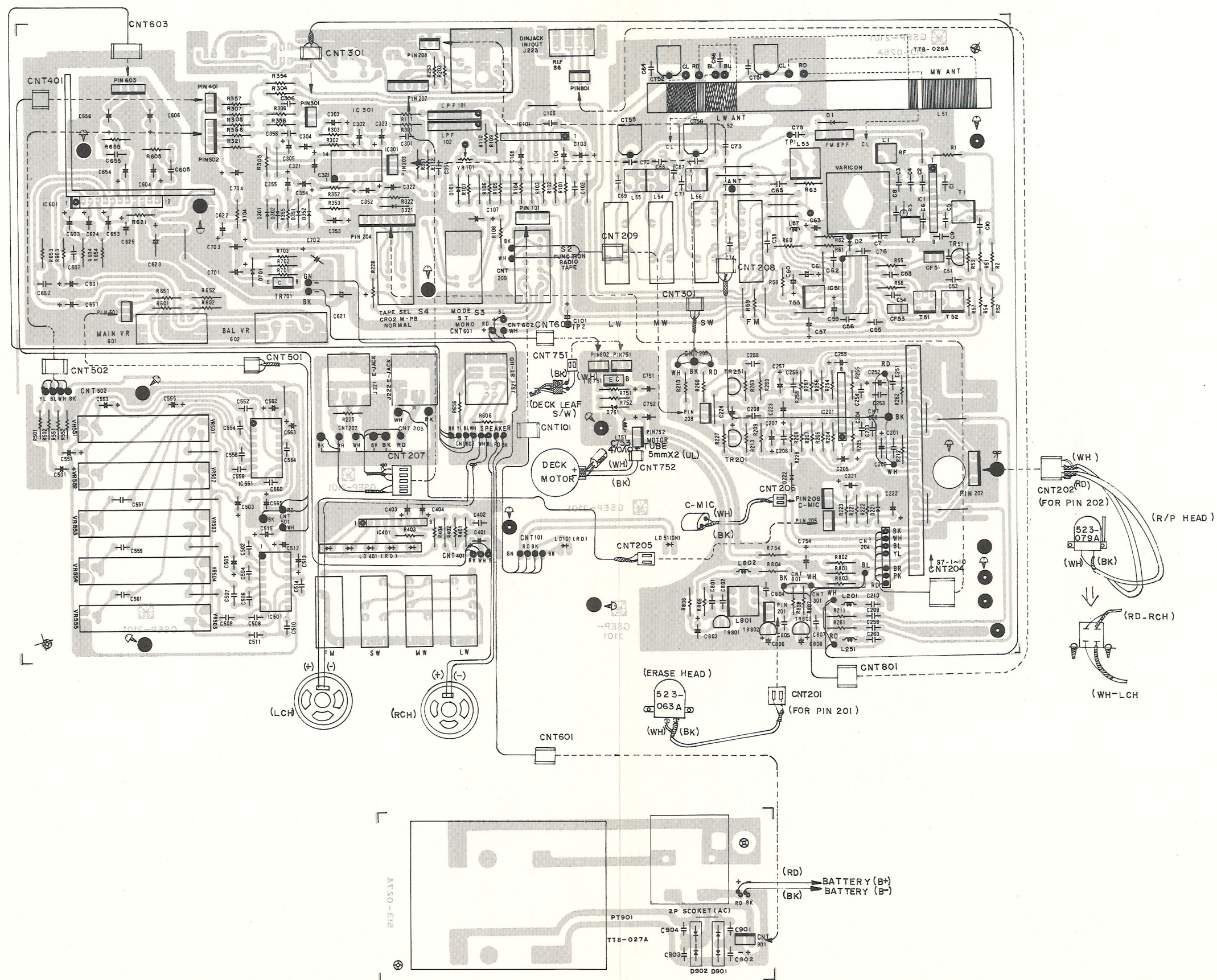


(Left channel is the same as right)

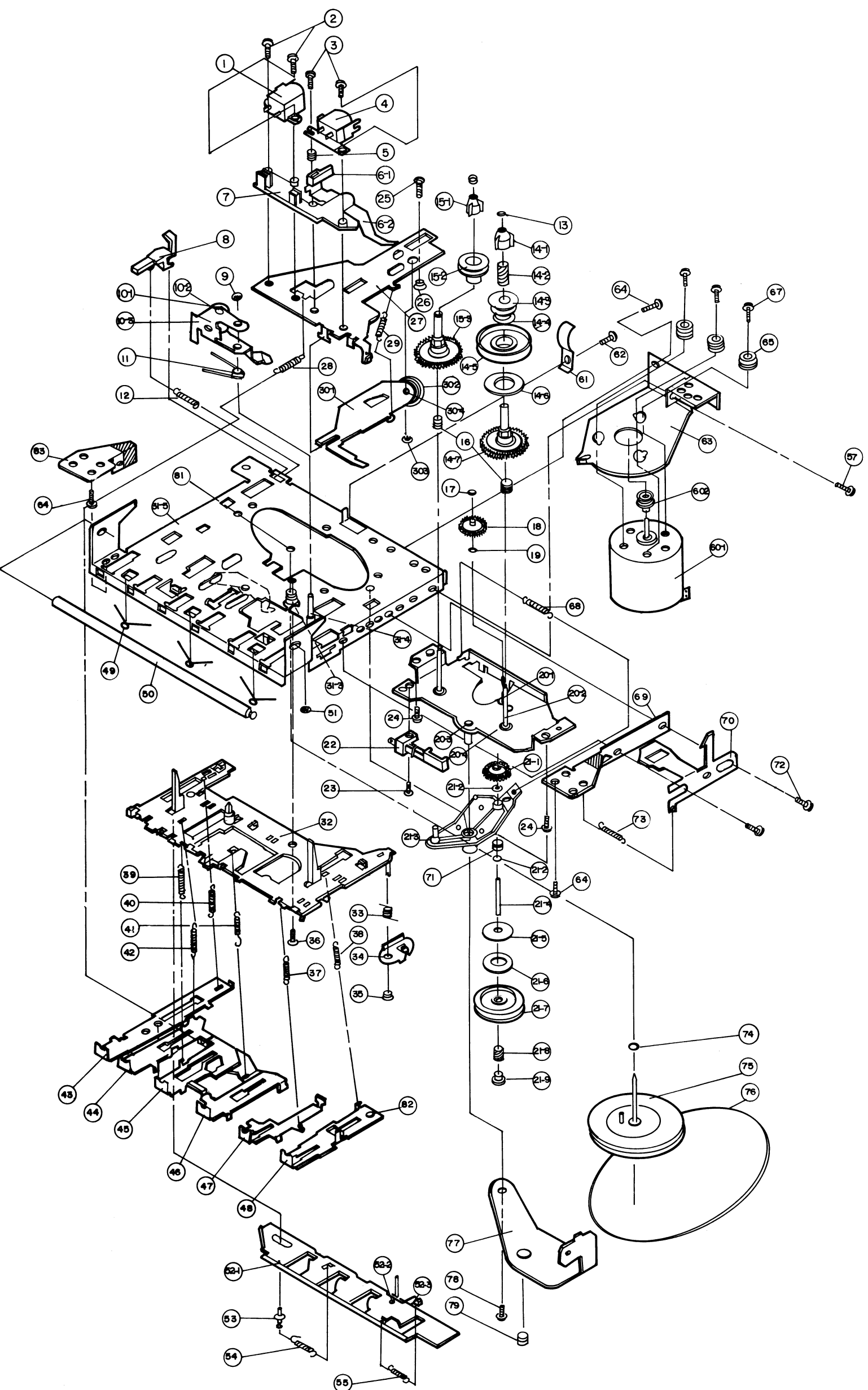
P.C. BOARD ASSEMBLY (COMPONENTS SIDE) & WIRING DIAGRAM



P.C. BOARD ASSEMBLY (COMPONENTS SIDE) & WIRING DIAGRAM



EXPLODED VIEW FOR DECK MECHANISM



ELECTRICAL PARTS LIST

CAUTION: A  in the schematic diagram and the parts list designates components which have special characteristics important to safety and should be replaced only with type identical to those in the original circuit or specified in the parts list. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 2 in this manual. Do not degrade the safety of the receiver through improper servicing.

Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
INTEGRATED CIRCUITS			COILS AND TRANSFORMERS		
IC1	668-108D	KIA7358P (FM FNT)	L1	635-020A	Coil, FM RF (OSC)
IC51	668-192A	KIA7640AP (AM/FM IF)	L2	635-020B	Coil, FM RF (OSC)
IC101	668-159A	KIA7343P (FM MPX)	L51/52	632-203E	Coil, MW/LW Ant
IC201	668-145A	LA3160 (PRE-AMP)	L53	634-609A	Coil, MW Ant (SW RF)
	668-110A	KA1222 (EQ)	L54	634-015C	Coil, MW OSC
IC301	668-163A	LA3220 (EQ)	L55	634-037F	Coil, LW OSC
	668-163B	KA2224 (Dual EQ AMP W/ALC)	L56	634-020E	Coil, SW OSC
IC401	668-638A	LB1423	L57	639-003N	Coil, Padding 3.3mH
IC501	668-655A	M5226P (Graphic EQ)	L201	637-005B	Coil, Peaking 33mH
IC551	668-655A	M5226P (Graphic EQ)	L251	637-005B	Coil, Peaking 33mH
IC601	668-625A	HA1392 (Audio-Power IC)	L751	639-003I	Coil, Padding 4.7μH
TRANSISTORS			L801	634-036C	Coil, Tape OSC
TR51	665-820B	KTC380TM-0	L802	639-003I	Coil, Padding 4.7μH
TR201	665-703B	KTC9013A-H	T1	644-018F	Trans, FM IF
TR251	665-703B	KTC9013A-H	T51	644-039M	Trans, MW IF
TR701	661N027A	GS-2013H	T52	647-011F	Discriminator
TR751	661N027A	GS-2013H	T53	644-013F	Trans, MW IF
TR801	665-703B	KTC9013A-H	 P/T 901	641-710C	Trans, Power AC220V 50HZ
TR802	665-704B	KTC9014A-C	SWITCHES AND JACKS		
TR803	665-704B	KTC9014A-C	S1	554-613Q	SW, Push-Band
DIODES			S2	556-611Q	SW, Lever-Function
D1	652-605B	IS2472-Switch	S3	556-611F	SW, Lever-Mode
D2	654-418A	IS2236-FM AFC	S4	556-611F	SW, Lever-Tape Selector
D101	652-605B	IS2472-Switch	S6	552-628A	SW, Slide-RIF
D222	652-605B	IS2472-Switch	S7	552-035F	SW, Slide-Tape R/P
D221	652-605B	IS2472-Switch	J221	571-101B	Jack, Mic
D301	652-605B	IS2472-Switch	J223	573-075B	Jack, Socket Din
D302	652-605B	IS2472-Switch	J621	571-102A	Jack, ST Headphone
D321	652-605B	IS2472-Switch		577-005C	Socket AC-IN
D351	652-605B	IS2472-Switch	MISCELLANEOUS PARTS		
D352	652-605B	IS2472-Switch	VR101	613-002C	VR, Semi Fixed 4.7kΩ-FM Pilot 38kHz Adjustment.
D701	654-616A	Zener, ZPD9.1	VR501	612-605H	VR, Slide 50kW G-EQ
D751	654-612B	Zener, ZPD10	VR502	612-605H	VR, Slide 50kW G-EQ
D901	652-021C	M1-151 Rectifier	VR503	612-605H	VR, Slide 50kW G-EQ
D902	652-021D	M1-151R Rectifier	VR504	612-605H	VR, Slide 50kW G-EQ
LD51	653-401B	LED, LN317RP REC	VR505	612-605H	VR, Slide 50kW G-EQ
LD101	653-401A	LED, LN217RP REC			
LD401	653-109A	LED, LN05202P RD			

Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
VR601	611-647X	VR, 20KA-Main	C-MIC	542-033A	Condenser Mic
VR602	611-648P	VR, 20kW-Balance	CT51	623N023B	Trimmer T1-1-8
B.P.F	616-011A	Filter, Band Pass-FM	CT52	623N023B	Trimmer T1-1-8
CF51	616-007A	Filter, Ceramic (BL, RD, OR)-FM	CT55	623N023H	Trimmer
CF53	616-003E	Filter, Ceramic-AM	CT56	623N023B	Trimmer T1-1-8
LPF101, 102	616-009A	Filter, Ceramic		622N048E	Varicon, Poly

MECHANICAL PARTS LIST

Cabinet

Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
A-6	271-172A	Knob, Tuning	C-31	541-186B	Speaker Piezo
A-7	272-254A	Knob, Volume	C-32	353-025G	Screw, Speical
A-8	273-689C	Knob, E.Q	C-33	MPC1836J	Screw, MPC + 3 × 8
A-11	221-442P	Cover, Battery	D-1	313-403A	Chassis
A-12	353-025R	Screw, Special Tapping 2 × 6	D-2	434N031A	Roller
C-1	217-026A	Case, Front	D-3	423N254A	Shaft, Roller
C-2	236-191A	Window, Scale	D-4	421-637A	Shaft, Tuning
C-3	226-037A	Door, CST	D-5	WE02200P	E-Ring D4
C-4	236-192A	Window CST, Door	D-6	361-148A	Pointer
C-5-1	412-082G	Deck, Mechanism DN-06FI	D-8	431-022A	Pulley, Dial
C-5-2	273-030C	Knob, Deck	D-9	MPC1530J	Screw, MPC + 2.6 × 6
C-5-3	321-665A	Bracket, Counter	D-10	447N054A	Cushion, Mic
C-5-4	517-114A	Tape Counter	D-11	353-025F	Screw, Special
C-5-5	451-145L	Belt, Counter	D-12	353-025G	Screw, Special
C-5-6	321-666A	Bracket Rec.	D-13	442N064A	Spring, M
C-5-7	MPC0922J	Screw	D-15	273-009A	Knob Lever S/W
C-5-8	WSB09000	Washer, Spring	D-17	353-025F	Screw, Special
C-5-9	321-664A	Bracket PWB Holder	E-1	217-027A	Case, Rear
C-5-10	353-022C	Screw	E-2	261-105A	Handle Ay
C-5-11	353-022C	Screw	E-3	532-102A	Antenna, Rod
C-5-12	321-013A	Bracket Deck	E-3-1	221-937A	Cover (Antenna)
C-5-12-1	353-022C	Screw	E-4	254-013A	Contact, Ant
C-10	444-003A	Damper Ay	E-5	353-025P	Screw, Special L=12
C-10-1	219-049A	Housing Damper	E-6	442-715C	Spring, Battery B
C-10-2	435-020A	Gear Damper	E-7	442-714D	Spring Battery-A
C-11	273-040A	Knob, Push	E-8	442-714B	Spring, Battery (A)
C-12	224-019A	Grille Speaker	E-9	563N126F	Terminal, Battery
C-13	246-050A	Deco, Speaker	E-10	423-003A	Shaft, Handle
C-14	224-018A	Grille Tweeter	E-11	221-206A	Cover E.Q SW
C-15	246-049A	Deco, Tweeter	E-12	353-025G	Screw, Special
C-17	353-025G	Screw, Special	F-1	511-026A	Main PWB Ay
C-18	353-052C	Screw, Special	F-1-46	542-033A	Condenser Mic
C-19	442-018B	Spring Cassette Holder	F-1300	255-850A	Heat Sink
C-20	353-025G	Screw, Special	F-2	511-027A	Rect PWB Ay
C-21	256-850A	Plate Reflect	 F-2-2	641-710C	Trans, Power AC220V 50Hz
C-23	353-052C	Screw, Special			
C-24	324-426A	Holder, Push Knob			
C-25	442-634G	Spring Knob			
C-30	541-208A	Speaker Woofer			

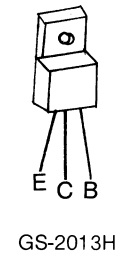
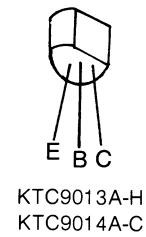
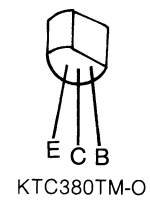
Deck Mechanism

Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
1	99A-0220	Head Erase	26	99A-0152	Shaft Head Panel
2	99A-0101	Screw	27	99A-0153	Base Head Panel
3	99A-0101	Screw	28	99A-0154	Spring Head Panel
4	99A-0221	Head R/P	29	99A-0155	Spring Idler
5	99A-0103	Spring Azimuth	30	99A-0156	Base Idler Ay
6	99A-0104	Arm Action Ay	30-1	99A-0157	Base Idler
6-1	99A-0105	Body Sesor	30-2	99A-0158	Idler Fwd
6-2	99A-0106	Arm Action	30-3	99A-0159	Washer
7	99A-0107	Bracket Head	30-4	99A-0160	Shaft Idler
8	99A-0108	Rec Safety Lvr	31	99A-0161	Chassis Sub Ay
9	99A-0109	Washer Stopping	31-3	99A-0164	Metal Flywheel
10	99A-0110	Pinch Rlr Ay	31-4	99A-0165	Shaft Pinch Rlr
10-1	99A-0111	Pinch Rlr	31-5	99A-0233	Chassis Main
10-2	99A-0112	Shaft Pinch Rlr	32	99A-0167	Chassis Mold
10-3	99A-0113	Frame Pinch	33	99A-0168	Spring Cam
11	99A-0114	Spring Pinch	34	99A-0169	Cam Pause
12	99A-0115	Spring Safety Rec	35	99A-0170	Cap-P
13	99A-0116	Washer	36	99A-0171	Screw
14	99A-0117	T-Reel Ay	37	99A-0172	Spring Stop Pause
14-1	99A-0118	Reel Cap	38	99A-0172	Spring Stop Pause
14-2	99A-0119	Spring Red Clutch	39	99A-0173	Spring Rew
14-3	99A-0120	Pulley T-Count	40	99A-0174	Spring Rec
14-4	99A-0121	Washer	41	99A-0222	Spring FF
14-5	99A-0122	Pulley Reel	42	99A-0175	Spring Fwd
14-6	99A-0123	Felt	43	99A-0176	Lever Rec
14-7	99A-0124	Gear Reel Body	44	99A-0177	Lever Fwd
15	99A-0125	Reel Ay Supply	45	99A-0178	Lever Rew
15-1	99A-0126	Reel Cap	46	99A-0179	Lever FF
15-2	99A-0127	Pulley S-Count	47	99A-0180	Lever Stop
15-3	99A-0128	Gear Reel Body	48	99A-0181	Lever Pause
16	99A-0129	Spring B Tension	49	99A-0182	Spring Button
17	99A-0130	Washer	50	99A-0183	Shaft Lever
18	99A-0131	Gear FF	51	99A-0184	Washer Stopping
19	99A-0132	Washer	52	99A-0185	Plate Lock Ay
20	99A-0133	Base Reel Ay	52-1	99A-0136	Plate Lock
20-1	99A-0134	Shaft FF	52-2	99A-0187	Shaft Arm Auto Stop
20-2	99A-0231	Shaft Reel	52-3	99A-0188	Arm Auto Stop
20-3	99A-0136	Shaft Center Arm	53	99A-0189	Cap-L
20-4	99A-0137	Base Reel	54	99A-0190	Spring Lock
21	99A-0138	Arm Center Ay	55	99A-0191	Spring Arm Stop
21-1	99A-0139	Gear Center	57	99A-0192	Screw
21-2	99A-0140	Washer	60	99A-0193	Motor Ay
21-3	99A-0141	Arm Center	60-1	99A-0194	Motor
21-4	99A-0142	Shaft Center	60-2	99A-0234	Pulley Motor
21-5	99A-0143	Shaft Center Pulley	61	99A-0196	Spring Cst
21-6	99A-0144	Felt	62	99A-0197	Screw
21-7	99A-0145	Pulley Center-B	63	99A-0198	Bracket Motor
21-8	99A-0231	Spring Clutch-C	64	99A-0197	Screw
21-9	99A-0147	Bushing Pivot	65	99A-0199	Rubber Motor
22	99A-0148	S/W Leaf	67	99A-0235	Screw
23	99A-0149	Screw	68	99A-0202	Spring Center Arm
24	99A-0150	Screw	69	99A-0225	Bracket-R
25	99A-0151	Screw	70	99A-0204	Lever Eject

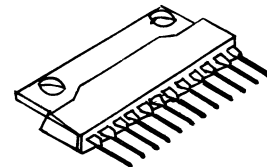
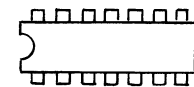
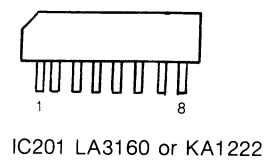
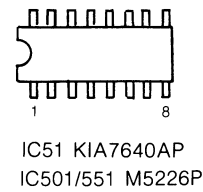
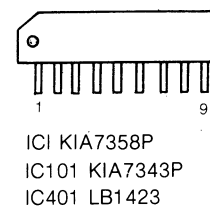
Ref. No.	Mfr's Part No.	Description	Ref. No.	Mfr's Part No.	Description
71	99A-0236	Shaft Eject	77	99A-0211	Bracket Flywheel
72	99A-0237	Screw	78	99A-0212	Screw
73	99A-0207	Spring Eject	79	99A-0213	Bushing Trust
74	99A-0208	Washer	81	99A-0214	Washer
75	99A-0238	Flywhel Ay	82	99A-0215	Shaft Pause Lock
76	99A-0239	Belt Main	83	99A-0216	Bracket Side

TRANSISTOR & IC LEAD IDENTIFICATION AND IC INTERNAL DIAGRAM

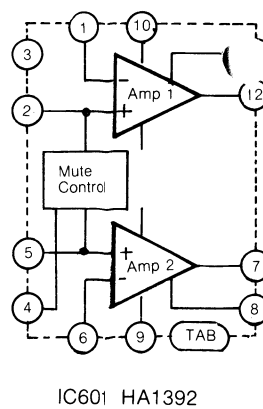
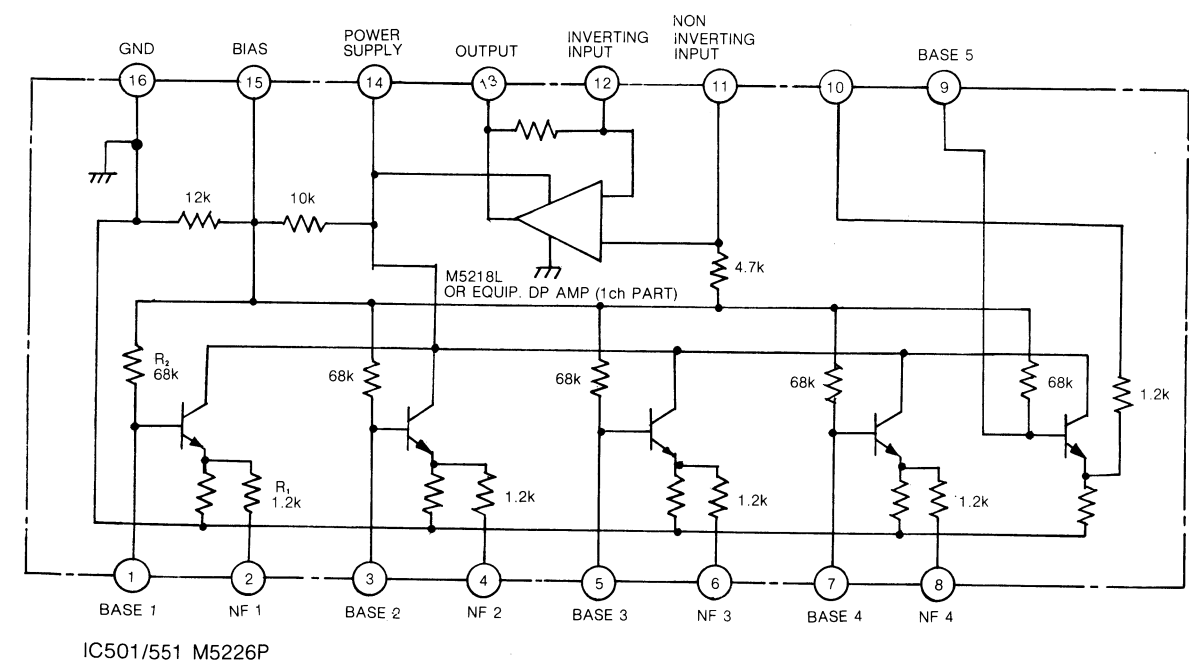
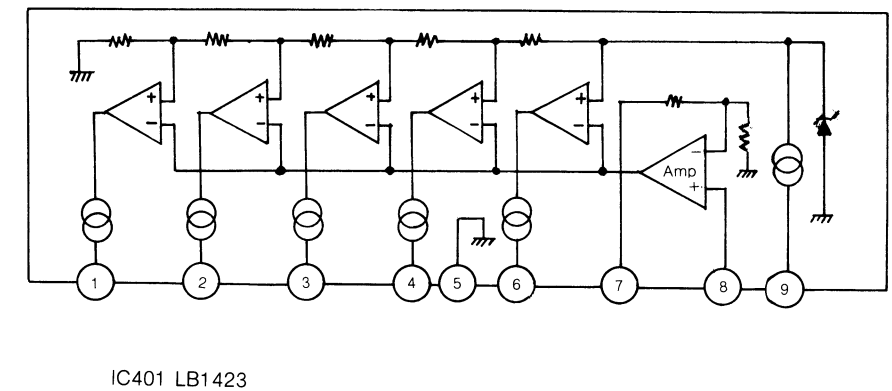
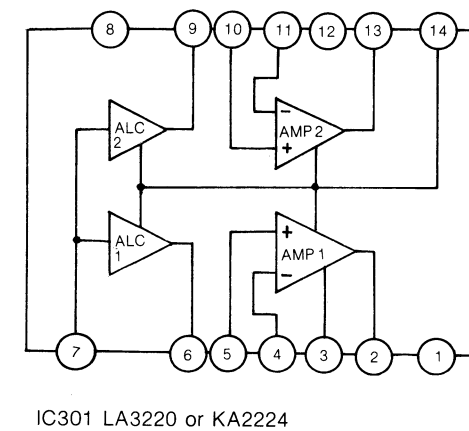
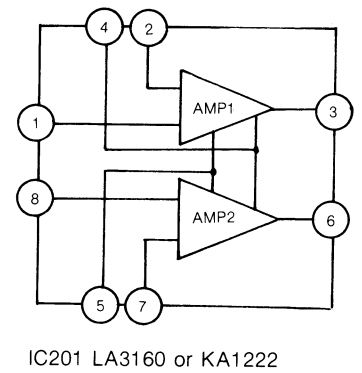
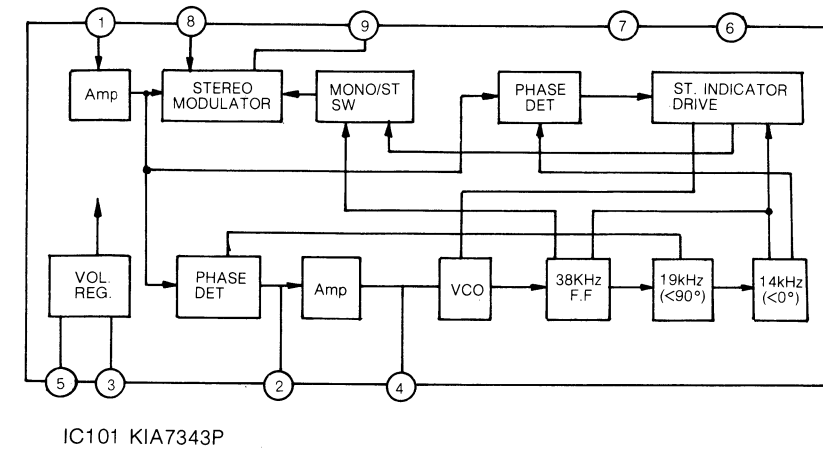
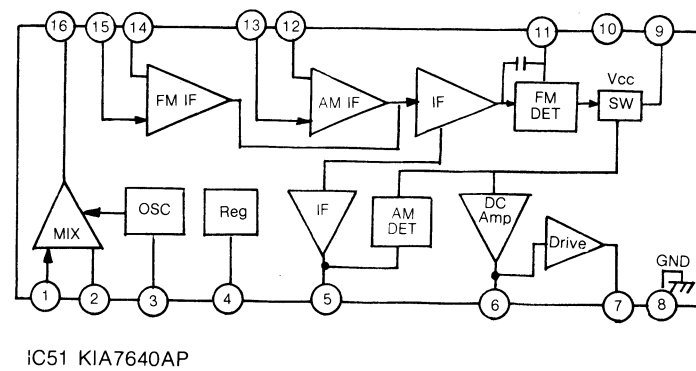
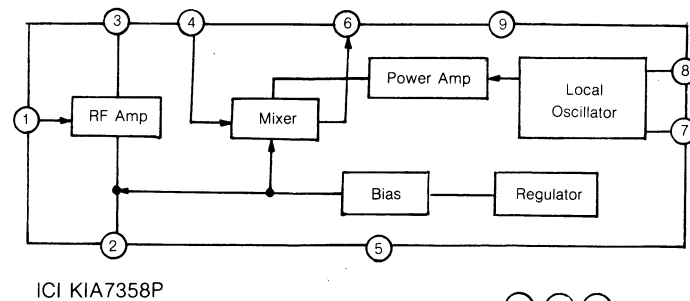
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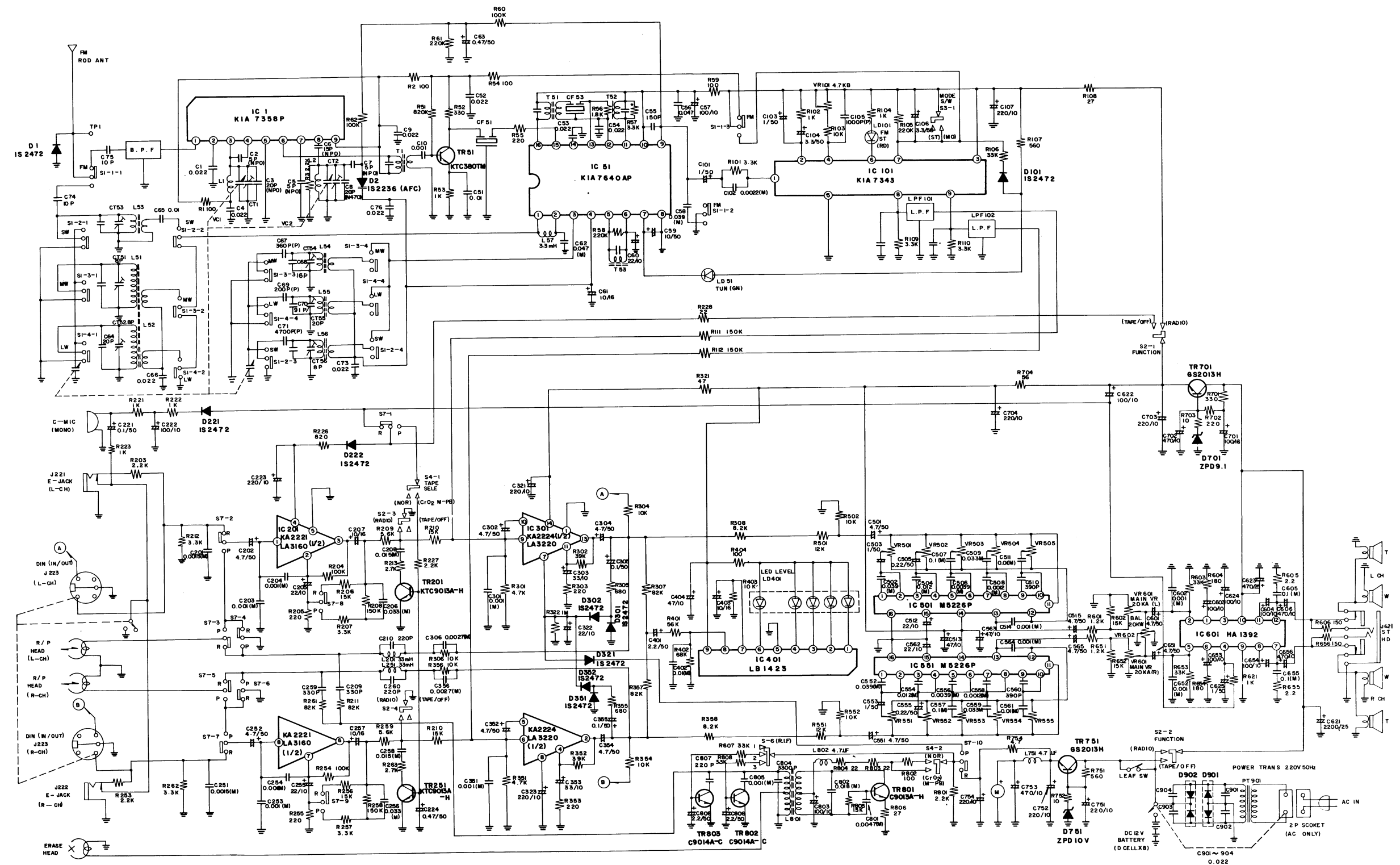
IC BASING



IC INTERNAL DIAGRAM

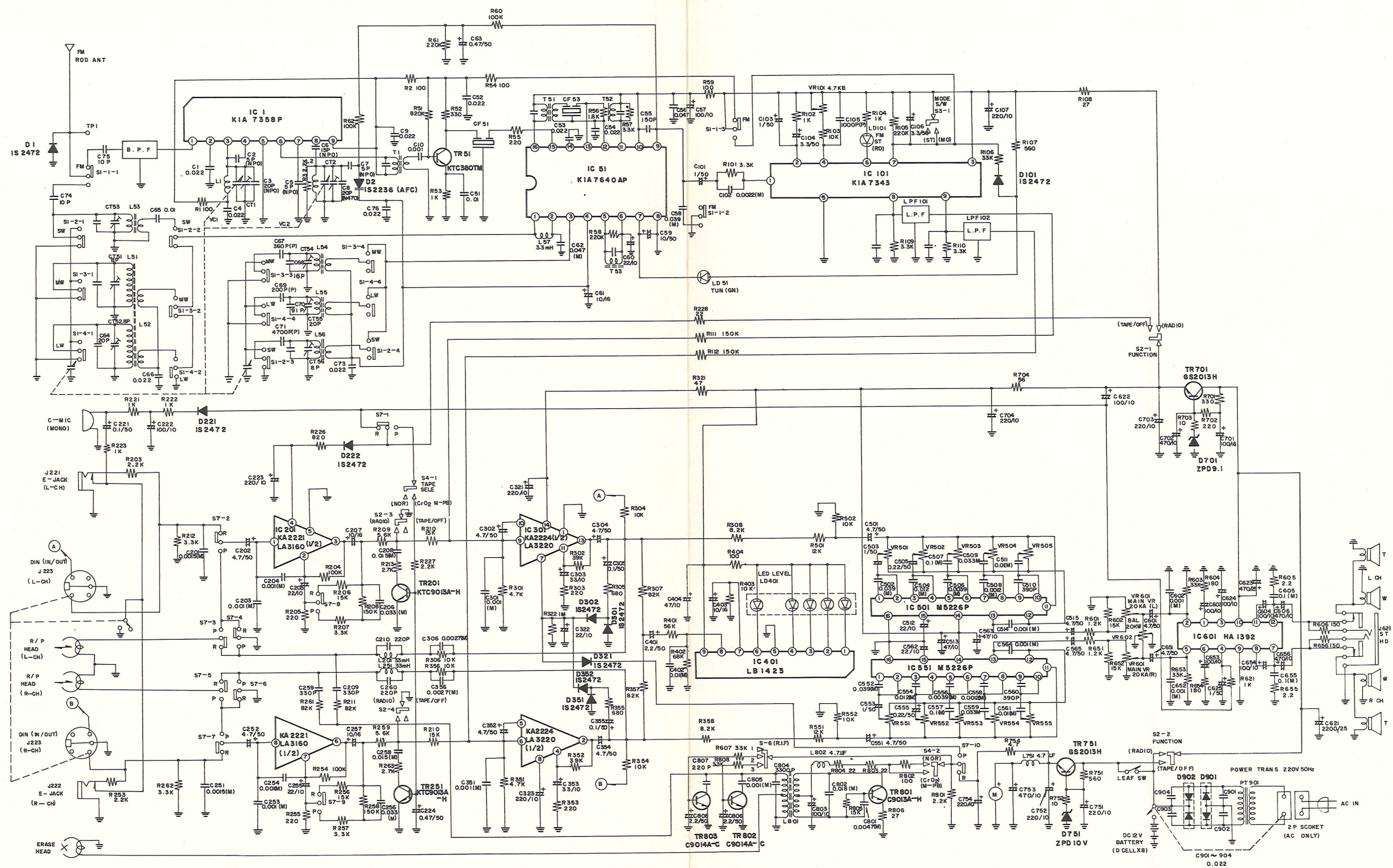


SCHEMATIC DIAGRAM



- NOTES
1. RESISTANCE VALUES IN OHMS CAPACITANCE IN MICROFARADS UNLESS OTHERWISE SPECIFIED.
 2. THIS SCHEMATIC DIAGRAM MAY BE CHANGED FOR IMPROVEMENT OF PERFORMANCE WITHOUT NOTICE.

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